



Ferroelastic phase transition in $[(C_2H_5)_4N][(CH_3)_4N]MnBr_4$.

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Streszczenie

Crystal growth, DSC, X-ray structural studies, optical observation and dielectric studies for a new hybrid organic–inorganic $[(C_2H_5)_4N][(CH_3)_4N]MnBr_4$ crystal are presented. The studies revealed reversible first-order phase transition of a ferroelastic type at 484/482 K on a heating and cooling run, respectively. Unusual feature of this transition is reduction of symmetry on heating run. At room temperature phase the crystal is tetragonal with the space group $P4_21m$ and above the phase transition temperature it is orthorhombic with the space group $P21212$. The symmetry change at the transition fulfills the reverse group–subgroup relation. Above the phase transition, the ferroelastic domain structure consistent with Aizu's species $4^-2mF222$ was revealed by polarized microscopy observation. The phase transition exhibiting such features has not been presented so far. Dielectric studies revealed a significant increase of losses connected with conductivity. The temperature dependence of conductivity and conductivity relaxation time fulfill the Arrhenius relation and activation energies are estimated.

Słowa kluczowe

Phase transition, dielectric properties, domain structure, ferroelasticity

Adres publiczny

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